

Work Order ID 72417

Monday, July 25, 2011 1:14:55 PM



Page 1

Item ID: D212-664-201

Accept



Setup Start

Revision ID: ~~U/R~~

Item Name: Crosstube Aft

Stop



Start Date: 7/25/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 8/11/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan: 

Date: 11-07-27

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Draw Nbr

Revision Nbr

D212-664-241

Rev D ~~U/R~~

DSI9563

A

CN 11-614

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D212-664-201

CH0005

005 8 w/10/26



110

0.00



Pick Kit

Packaging

Memo

0.00

Packaging

Packaging

Jaw
Mo

11-10-05

B7 2417 D212-664-201

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120	BENDING MACHINE - CROSSTUBES	0.00							
CNC Bend 2	Memo	0.00							
CNC Alpha 160 Bender	Bend tube as per Dwg D212-664-241 using CNC bender program 212- aft								
130	QC15- Crosstube Dimensional Check	0.00							
QC	Memo	0.00							
Quality Control									

JW
MO

11-10-05

8/11/06

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

140



Crosstubes

Crosstubes

Crosstubes

0.00

Memo

0.00

1-Drill pilot holes in tube as per Dwg D212-664-241 using drill Jig DT8550, DT8551, drill table DT8577 and locate tower holes #8 as per QSI0010.

2-Ream hole to finish size in tube as per Dwg D212-664-241 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-241

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-241

ET
11-10-06

JW
11-10-07

11-10-07

150



HandFXtube

Hand Finishing Crosstubes

Crosstubes Chemical Conversion

0.00

Memo

0.00

Chemical Conversion Coat as within 24 hours of bending and drilling

JW
11-10-07

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Revision ID: U/R

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Cust Item ID:

Required Date: 8/11/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

8/10/11

170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

8/10/11

180

Outsource process - NDT per QSI038 4.1

0.00



Outsource2

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038
Issue P/O: *15157*
LPI as per ASTM 1417 Level 2
Attach copy of NDT results to work order*11-10-14*

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries

Monday, July 25, 2011 1:14:55 PM

Comments:

Page 5

Accept

Revision ID: U/R

Item Name: Crosstube Aft

Start Date: 7/25/2011 **Start Qty:** 1.00

Required Date: 8/11/2011 **Req'd Qty:** 1.00

Reference:

Cust Item ID:

Customer:

Setup Start

Stop

Run Start

Stop

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center ID

Operation Description

Set Up/ Run Hours

Tool ID

Tool #Plan
Code

Accept Qty

Reject
QtyReject
Number

**Insp.
Stamp**

190

Receive & Inspect for Damage & Mat'l Certs
Packaging

0.00

Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

200

QC5- Inspect part completeness to step on W/O

0.00

QC

Memo

0.00

Quality Control

Inspect for damage & ensure results are as per Dwg D212-664-241

Supply (1)

11 10 17 (1)

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Stop



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Cust Item ID:

Required Date: 8/11/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210

Spray Painting per QSI005 4.2

0.00



SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-241 with White Imron as per QSI 005 4.2

PRIME:

Start Time: 3:00 > ml 11/10/17 ①

Finish Time: 4:00

PAINT:

Start Time: 9:30 > ml 11/10/18 ①

Finish Time: 11:00

ml 11/10/18 ①

220

QC14- Inspect Spray Paint

0.00



QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

BT 11-10-19

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Work Order ID 72417

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Item ID: D212-664-201

Accept



Setup Start



Revision ID: U/R

Stop



Item Name: Crosstube Aft

Start Date: 7/25/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 8/11/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

230



Crosstubes

Crosstubes

0.00

Crosstubes

Memo

0.00

1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 41058 wash 'n' wipe

2-Install supports with Proseal 890 per DSI9563 and QSI 015
A/R Proseal 890 Batch: 118234

3-Install clamps as per Dwg D212-664-241. Torque clamps to 80-100 in lb. > 11/10/210

W 11 10 20 (1)

240



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

8 11/10/26

250



Packaging

Packaging

Pick Kit

0.00

Memo

0.00

SP 11-10-26

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Work Order ID 72417

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Item ID: D212-664-201

Accept



Setup Start



Revision ID: U/R

Stop



Item Name: Crosstube Aft

Start Date: 7/25/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 8/11/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

260

QC4- 100% Inspect kits for completeness

0.00

8/11/10/76



QC

Memo

0.00

Quality Control

FD

270

Packaging

0.00

Reun



Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-201

11/10/28

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/10/28

MF 11-10-27

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Picklist Print

Monday, July 25, 2011 1:15:00 PM

Page 1

Work Order ID: 72417

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft



Start Date: 7/25/2011

Required Date: 8/11/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat K/DS
 IPP Rev:F 06-03-29 Remove Coments on Pick List JLM
 IPP Rev:G 07-04-30 As per Rev C JLM
 IPP Rev:H 08-05-22 up date Qty of rubber cushion DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664- 201TRNRevC		Manufactured	No	B72041		110	Each	0.0000	1	1			
Crosstube Turning Detail													
D3595-063-530		Manufactured	No			230	Each	70.0000	2	2			
RUBBER CUSHION													

MO 4-10-05

W 11-10-20

Location	Loc Qty	Loc Code
LG	56	
70067	56	
LG055	14	
63407	6	
67185	8	

D2940-1 Manufactured No



Support

230 Each 15.0000 2

W 11-10-20

Location	Loc Qty	Loc Code
LG	15	
70737	15	

B# 71308

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Picklist Print

Monday, July 25, 2011 1:15:00 PM

Page 2

Work Order ID: 72417

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft

Start Date: 7/25/2011

Required Date: 8/11/2011

Start Qty: 1.00

Required Qty: 1.00

MS21920-28

Purchased No

230 Each

31.0000

4

4



Clamp(per MIL-DTL-8783C)



11-10-20

B# 118713

Location

Loc Qty

Loc Code

FG

5

105884

5

LG050

26

116839

2

117998

24

D3428-1

Manufactured No

250 Each

28.0000

1

1



Placard



SP

Location

Loc Qty

Loc Code

ST053

28

68920

6

71168

10

72048

12

MS21042L6

Purchased No

250 Each

382.0000

6

6



Nut



1x

SP

Location

Loc Qty

Loc Code

ST300

382

117677

200

118078

82

118384

100

AN960JD616

NAS1149D0663J

Purchased No

250 Each

0.0000

18

18



Washer



SP 11-10-26

m118614

Monday, July 25, 2011 1:15:00 PM

Shop Packet Print

Page 2

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Work Order ID: 72417

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft

Start Date: 7/25/2011

Required Date: 8/11/2011

Start Qty: 1.00

Required Qty: 1.00

AN6-40A

Purchased

No

250

Each

122.0000

4

4



Bolt



SP

Location

Loc Qty

Loc Code

ST340

72

117366

22

118422

50

ST343

50

117688

50

4x

AN6-41A

Purchased

No

250

Each

46.0000

2

2



Bolt



SP 11-10-26

Location

Loc Qty

Loc Code

ST344

46

117366

40

118191

6

2x

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

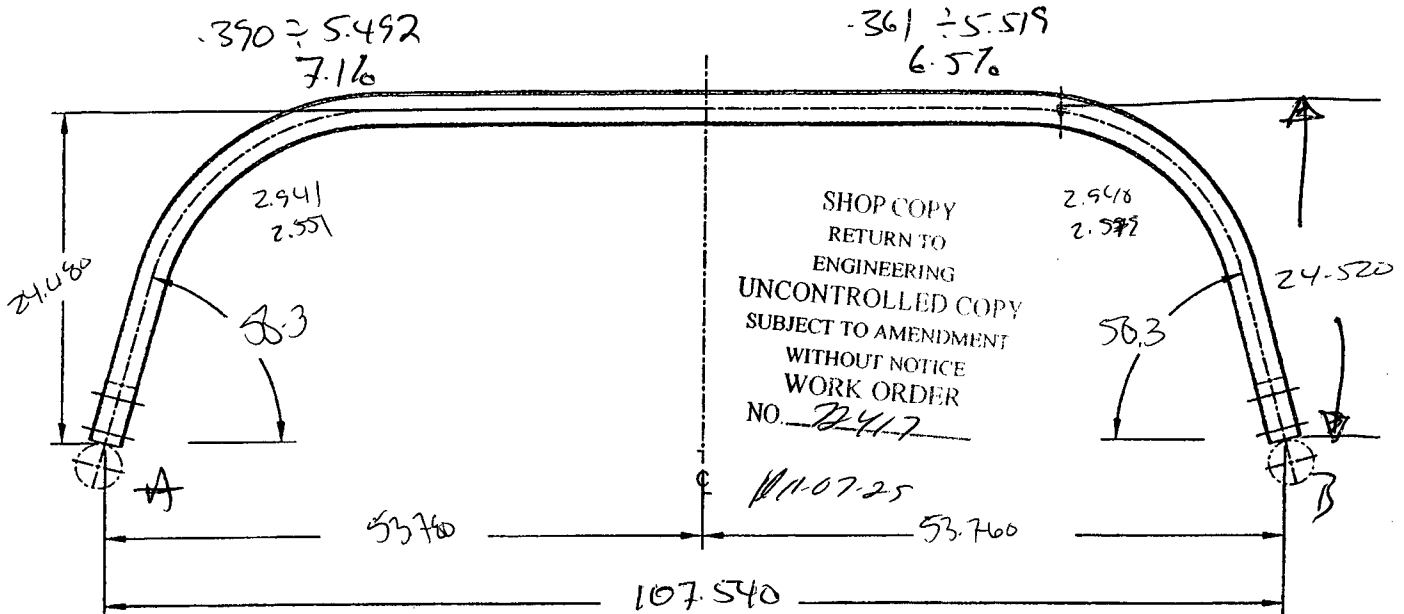
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	7241 F
Description: Crosstube High Aft (205/212)	Part Number:	D212-664-201
Inspection Dwg: D212-664-241	Rev: D	Page 1 of 1

Required Dimension	Min	Max
Height	24.17	24.43
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70



Side	Comments
Side A =	7.16 crush @ 13 passes
Side B =	6.57 crush @ 14 passes
Bend high, & crushing high. Acceptable. 11.10.06 AS 042	

QC15 Inspection	S
Date	11/10/06

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. C	KJ/JLM	
C	10.04.01	Dwg Rev updated	KJ	

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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D212-664-201 72417 ECN 11-614

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

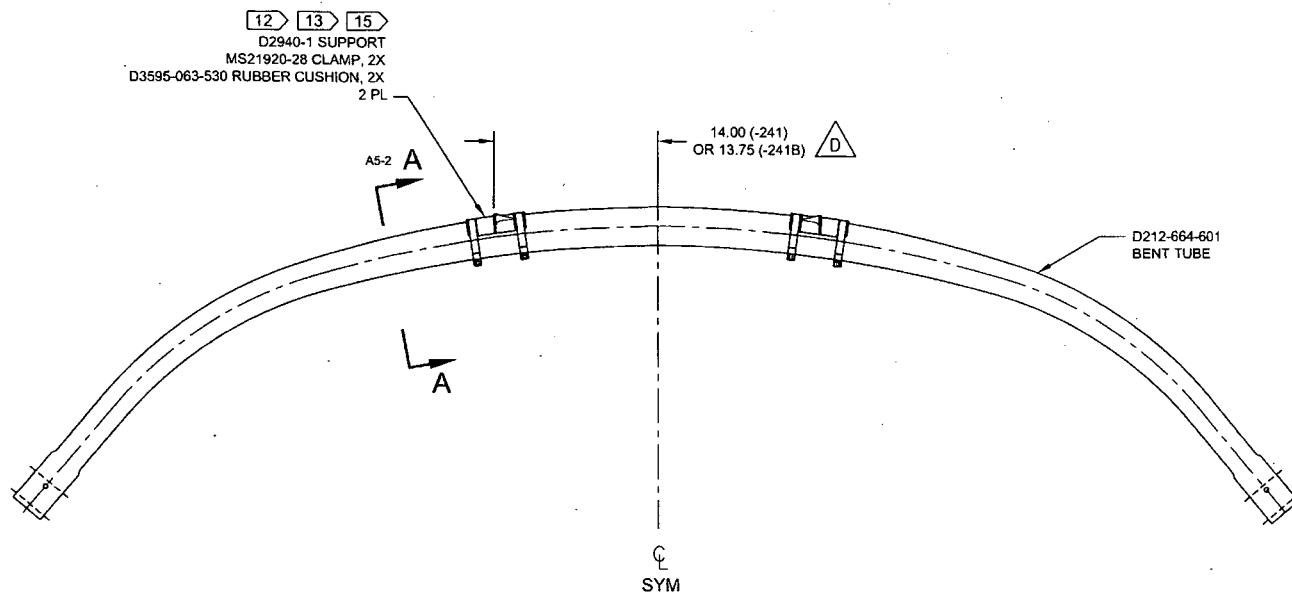
- MATERIAL: MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124.362±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

ECN # 11-614
11.08.25
UNDER REVIEW

DEO ATTACHED

RELEASED
2009-10-29

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-241	SHEET 1 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
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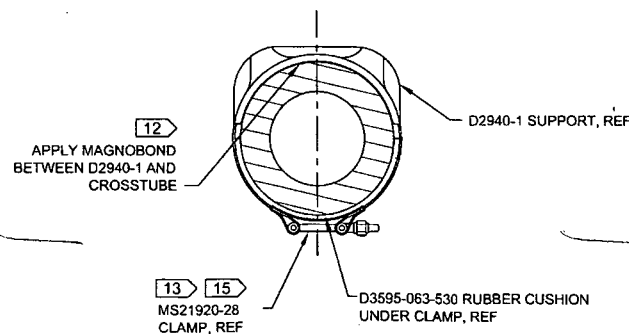


**D212-664-241/-241B
ASSEMBLY DETAIL**

600#11-614
11.07.26
UNDER REVIEW
06.13

DEO ATTACHED

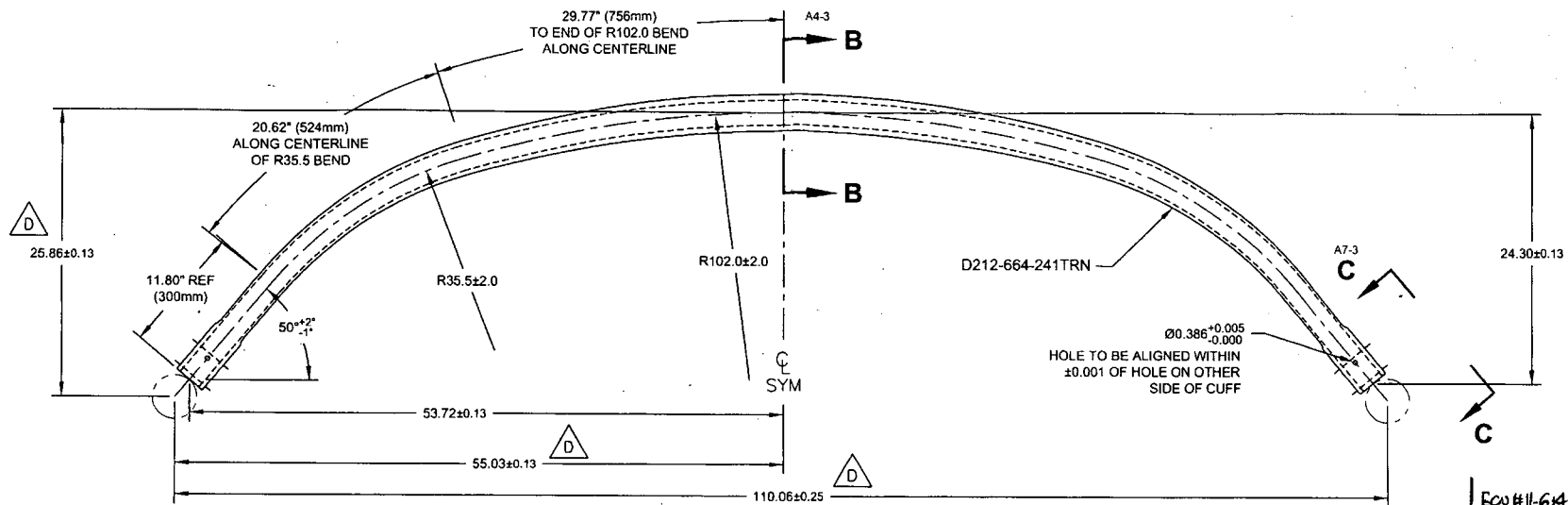
RELEASED
2009-10-28



SECTION A-A
SCALE 4X D6-2

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. D
MFG. APPR.	DS	D212-664-241	SHEET 2 OF 4
APPROVED	AP	TITLE	SCALE
DE APPR.	HL	CROSSTUBE ASSY (205/212 HI AFT)	NTS
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8 7 6 5 4 3 2 1



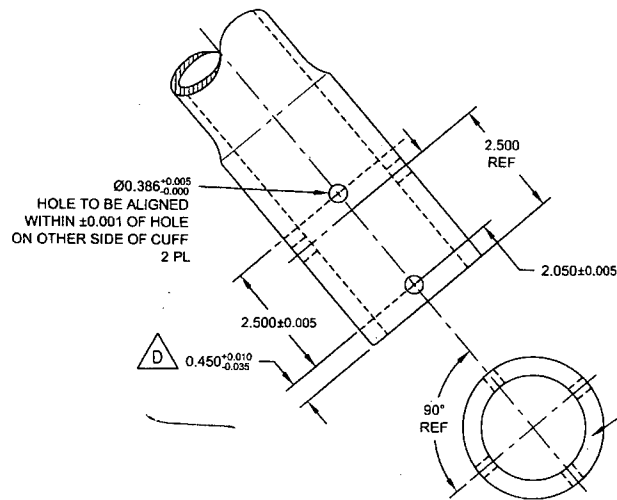
D212-664-601 10 D
BENDING AND DRILLING DETAIL

ECO #11-614
 1.07.26

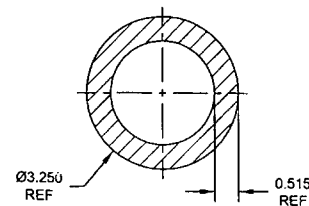
UNDER REVIEW
4/11/06

DEO ATTACHED

RELEASED
 2009-10-29



VIEW C-C: CUFF DETAIL D2-3
 SCALE 3X



SECTION B-B D4-3
 SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. D
MFG. APPR.	Q	D212-664-241	SHEET 3 OF 4
APPROVED	Q	TITLE	SCALE
DE APPR.	Q	CROSSTUBE ASS'Y (205/212 HI AFT)	INTS
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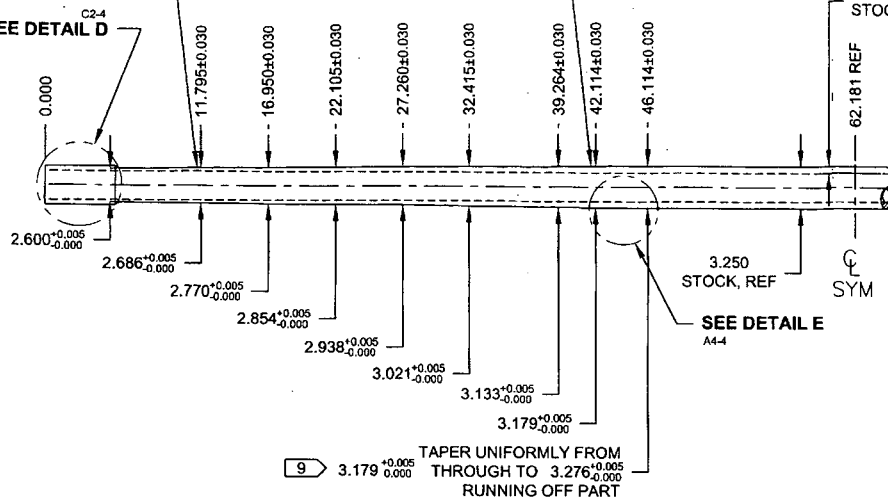
8 7 6 5 4 3 2 1

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

0.515 WALL
STOCK, REF

SEE DETAIL D



9
30° X 0.500 DEEP
CHAMFER

SEE DETAIL F

DETAIL D:
CROSSTUBE CUFF
SCALE 5X

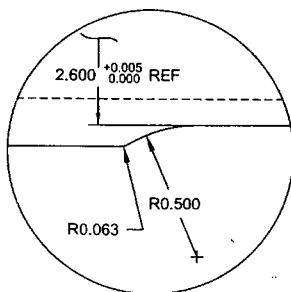
600AH-614
H.07.28

UNDER REVIEW

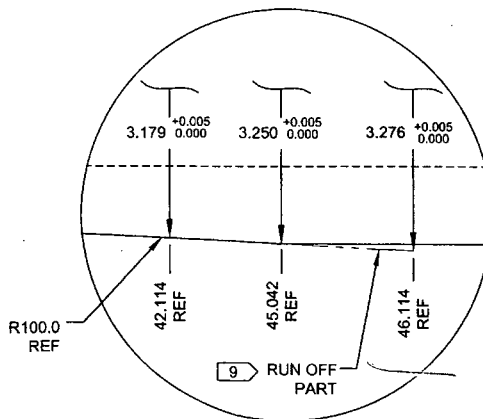
DEO ATTACHED

RELEASED
2009-10-29

D
D212-664-241TRN
TURNING DETAIL



DETAIL F:
CUFF TRANSITION
SCALE 10X



DETAIL E:
TAPER RUN-OFF
NOT TO SCALE

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	90	DRAWING NO.	REV. D
MFG. APPR.	DS	D212-664-241	SHEET 4 OF 4
APPROVED	AD	TITLE	SCALE
DE APPR.	TH	CROSSTUBE ASSY (205/212 HI AFT)	NTS
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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED		MFG. APPR.		APPROVED	DE APPR.	
DATE 11.04.07	DATE 11.04.11		DATE 11.04.12		DATE 11/04/12	DATE 11.04.12	

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

UNDER REVIEW

11.16.13

BCN#1-614

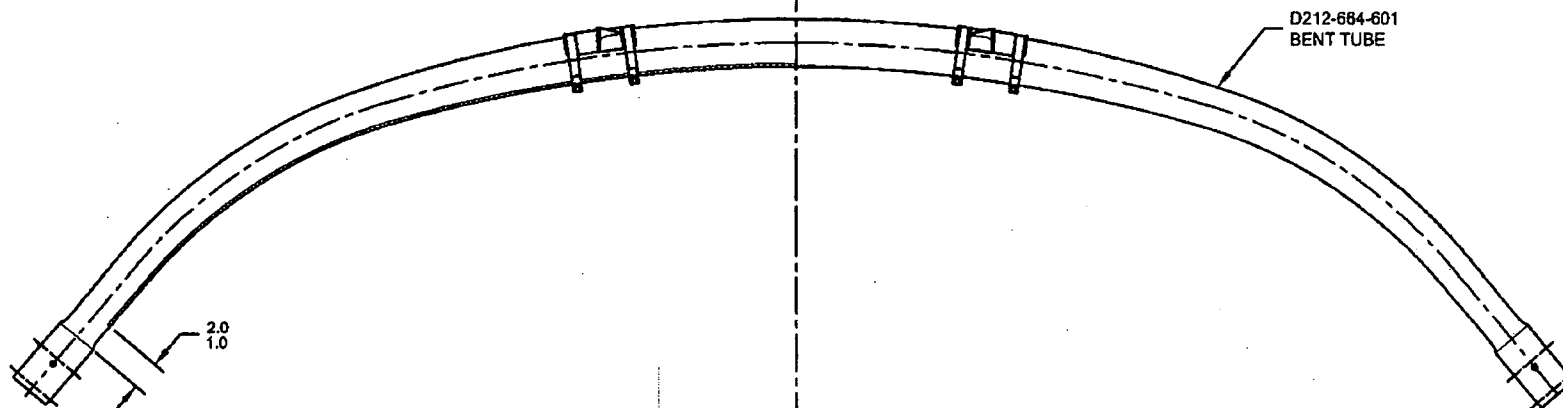
11.07.28

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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>CP</i>	MFG. APPR. <i>E</i>	APPROVED <i>MD</i>	DE APPR. <i>MD</i>			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

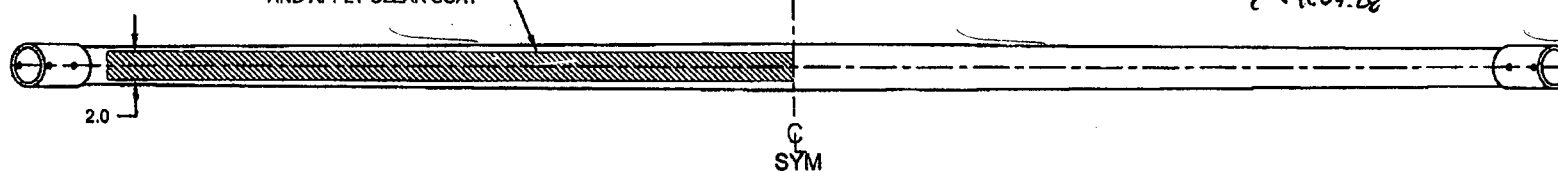
IS:



WAS:

**D212-664-241/-241B
ASSEMBLY DETAIL**

MASK AREA PRIOR TO PAINTING,
REMOVE MASKING AFTER PAINT
AND APPLY CLEAR COAT



RELEASED
2011-04-18 *MD*

UNDER REVIEW

CP 11.06.13
D212-664-241
11.07.28

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASS'Y (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN 92	CHECKED ASS	MFG. APPR. 8	APPROVED MAD		DE APPR. H		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11/27/21		DATE 11-07-21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -241	Qty -241B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

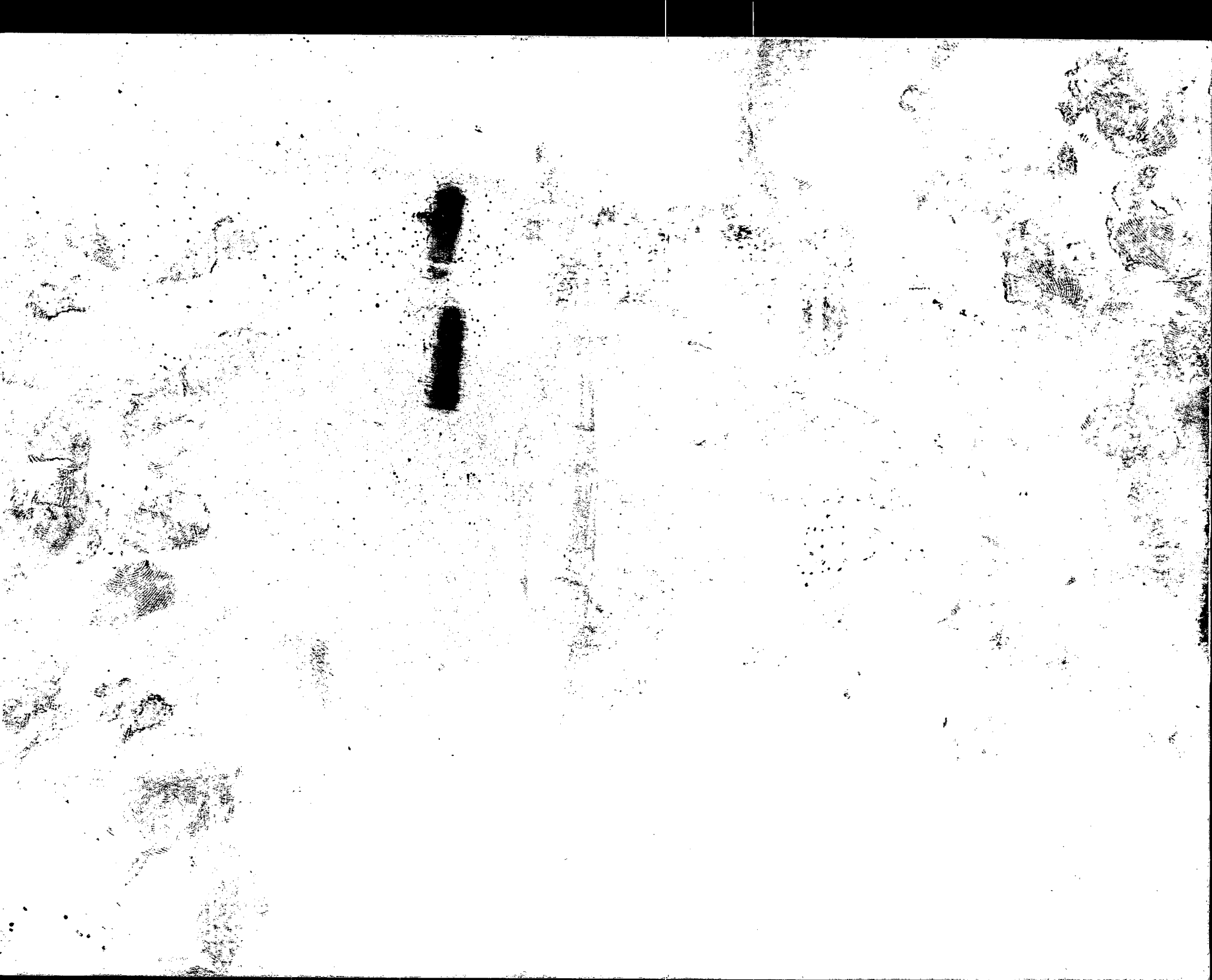
IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
JW





LIQUID PENETRANT TEST REPORT

P- 05634

CLIENT DART AEROSPACE DATE OCT-14-2011 PAGE 1 OF 1
ATTENTION LINDA / CHARLIE / VAN / MATT ACUREN JOB NO. 188-11-02196 TIME AM ☒ PM ☐
ADDRESS 1270, ABERDEEN ST. PO/WO NO. 115157
HAWKESBURY, ON WORK LOCATION AS ADDRESS
PROJECT PT -> WET FLUORESCENT LIQUID PENETRANT ON 'CROSSTUBES' ACCEPTANCE STD. ASTM A7/CST 038 REV./DATE 2005
ITEM(S) EXAMINED - SEE BELOW -

JOB DESCRIPTION PROCEDURE NO. LT-002 REV./DATE 2007 TECHNIQUE NO. LT-002 REV./DATE 2007
PART NO. ALUMINUM ALUMINUM MATERIAL ALUMINUM THICKNESS ALUMINUM
SCOPE PERFORMED A WET FLUORESCENT LIQUID PENETRANT INSPECTION ON 100% OF THE EXTERNAL SURFACE ON ITEMS MENTIONED BELOW

TEST DETAILS
METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND MAGNA FLUX BLACK LIGHT S/N 13798 OUTPUT > 1000 μ W/cm² ☐ AMBIENT < 2 fc
PENETRANT ZL-67 MINIMUM DWELL TIME 10 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER H2O MINIMUM DRY TIME >10 MIN. OTHER
DEVELOPER SKD-52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N CAL DUE DATE AUG-2011
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE
SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE ☐ < -4°C/20°F ☐ -4°C/20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

ITEM ID	DESCRIPTION	STATUS
1	CROSSTUBE W.D ID 72417	✓
2	72418	✓
3	73042	✓
4	73690	✓
5	73691	✓
6	74330	✓
7	74686	✓
8	74687	✓

NO RELEVANT INDICATION WAS DETECTED AS PER APPLICABLE STANDARDS.

ITEM ID | D212-664-201 AFT
D212-664-201 AFT
D212-664-101 FWD
D412-664-203 AFT
D412-664-203 AFT
D412-664-101 FWD
D407-667-105 FWD
D407-667-105 FWD

ME 11-10-17

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES
CLIENT REPRESENTATIVE John T. Healy DTR # E 44768
TECHNICIAN (SIGNATURE): JAMES DESROSIERS REPORT REVIEWED BY:
NAME (PRINT): JAMES DESROSIERS NAME INITIALS
CGSB LEVEL 2 SNT LEVEL 3049 CGSB LEVEL 2 SNT LEVEL 3049
CGSB REG. NO. 3049 CGSB REG. NO. 3049